

merly vast herds of buffalo, and at present the herds and flocks of the western stockman, obtain from it a great part of their winter's food. The reason of this lies in the fact that in the mature plant, as found in autumn and winter, the solid culms and stolons, together with the leaves, are perfect store-houses of food materials. Every parenchyma cell is packed with starch grains. Buchloë, when ripe, furnishes more nutriment, considering the size of the plant, than almost any other grass.

Lincoln, Neb.

JARED G. SMITH.

Color variation in flowers of *Delphinium*.

The dwarf larkspur, *Delphinium tricorne* Michx., is a common plant in many parts of the Mississippi valley, and is the only one, so far as I know, growing in the immediate vicinity of St. Louis. It is well marked by its cluster of tuberous thickened roots, the three pistils to each flower, and smooth seeds. The flowers are usually blue, and our manuals say occasionally white; but till this spring I did not see any of the white forms. Early this spring a great deal of it was found on the rocky limestone bluffs at Glencoe, Mo., appearing somewhat earlier than the blue form. Some weeks later I had occasion to collect in the region of Bluff Lake, well known to local botanists for the number of interesting phænogams found there. Not only did I find large numbers of the white-flowered form, but a beautiful purple-flowered form. This form was found, along with the blue and white forms, in rich woods. Mr. Letterman, who has closely observed this species for many years at Alenton, Mo., says the white form is not uncommon. For several years I have also observed *Delphinium azureum* Michx. at La Crosse, Wis. It is common on silicious soils. The flowers of this species are usually sky-blue or whitish, according to descriptions. So far I have not found a single blue-flowered form at La Crosse. The flowers were always white or greenish white, very much like the white form of *Delphinium tricorne*.

St. Louis, Mo.

L. H. PAMMEL.

CURRENT LITERATURE.

North American Geraniums.¹

Our Geraniums have not been revised since Torrey & Gray's Flora, about 50 years ago. In the memoir before us Dr. Trelease has presented, with his usual completeness, not only descriptions of all our species, but some biological notes concerning them, their pollination, dissemination, etc. Of the genus *Geranium* we have 10 native species; *Erodium* has 4; *Limnanthes* 4, among which is a new species (*L. Macounii*) from Vancouver Island; *Floerkea* 1; *Oxalis* 13, with a new species (*O. Suksdorfii*) from Oregon. It seems that Elliott's *O. recurva* ranges north into Ohio, Indiana, etc., having been taken for a large form of *O. corniculata*, var. *stricta* (*O. stricta* of the Manual). With the 2 species of *Impatiens*, we have thus 34 native Geraniums. The author's biological notes concerning these various species are full of interest, but too detailed for proper presentation in this review.

¹ TRELEASE, WILLIAM.—North American Geraniaceæ. From the Memoirs of the Boston Soc. Nat. Hist. iv, pp. 71-103, with 4 plates. [Issued January, 1888.]

Minor Notices.

A LIST of species found by Mr. Henry M. Ami near Lake Temiscouata, in Quebec, is reprinted from the *Bull. Torrey Bot. Club*, pp. 134-136.

THE MICROSCOPICAL anatomy of the cedar apple (*Gymnosporangium macropus*) is treated by Mr. Elmer Sanford in the *Annals of Botany* for February, 1888, and is also issued as a separate reprint.

THE DEPARTMENT OF AGRICULTURE undertook some time ago an investigation of the problem of discovering what plants could be grown upon the arid regions of the southwest. Bulletin number six² gives a report of collections and notes made by Mr. G. C. Nealley in Texas, and by Prof. S. M. Tracy in Arizona, New Mexico, Nevada and Utah. About 200 species were collected, upon which various notes of greater or less interest are given. The conclusion reached from the reports is: "We may be assured that there are many which would prove useful in cultivation, and it is to be hoped that the experiment stations of the states embraced in the arid districts will give such a thorough trial." Which ones?

THE FOURTH FASCICLE of Castillo's *Illustrationes floræ insularum maris Pacifici* fulfills the promise of its predecessors. The ten lithographic plates are charming, while the text of the ten species is correspondingly elaborate. The species are all Compositæ, viz.: *Erigeron*, 2 species; *Lipochæta*, 5 species (3 of them new); *Bidens*, 3 species (1 new).

THE SECTION of Vegetable Pathology of the Department of Agriculture has been giving special attention to the diseases of the grape. Bulletin No. 5³ gives an account of the experiments in the application of various liquid and dry fungicides, such as sulphatine, etc., the basis of all of which is sulphate of copper. The results are somewhat contradictory, but sufficiently accordant to show that the remedies, or preventives rather, are valuable, and the experiments should be continued. As a supplement to the report appears a valuable chapter upon apparatus for applying fungicides, communicated by M. Paul Ferrouillat, professor of rural engineering at the National School of Agriculture, Montpellier, France. The bulletin shows a wide-awakeness and energy in this section which are highly commendable. It is to be hoped that Commissioner Colman will be able to secure an active and able successor for Mr. Scribner, whose administration has been most praiseworthy.

² VASEY, GEO.—Grasses of the Arid Districts (Dept. Agric., Bot. Div., Bull. No. 5), pp. 60, pl. 30, 8vo. Washington; Govt. Printing-office, 1888.

³ SCRIBNER, F. LAMSON.—Report on the experiments made in 1887 in the treatment of the downy mildew and the black-rot of the grape-vine, pp. 113, pl. 1, figs. 24, 8vo. Washington: Government Printing-office. 1888.